Climate change and disease emergence

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Ethiopian Health and Nutrition Research Institute (EHNRI) and Institute of Development Studies (IDS) workshop on climate change adaptation and nutrition with gender perspective in Ethiopia

30 October 2013
Dreamliner Hotel, Addis Ababa, Ethiopia

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Vector-borne diseases and climate change

- What are the most climate-sensitive diseases and why?
  - The most climate-sensitive diseases are those that are transmitted by arthropod vectors (VBD)
    - mosquitoes, ticks and flies
  - Distribution of vectors highly depends on climate; in turn disease distribution depends on vector distribution
  - Changes in climate alters vector distribution, which in turn changes distribution of disease

- Which climatic factors are the most important in distribution of vectors and VBDs?
  - Temperature and humidity play a major and complex role in vector survival and development

- How do temperature and humidity affect distribution of vectors and VBDs?
  - Effect of temperature is difficult to generalize: increase in temperature may expand or contract current range of vector
    - Increase in temperature may increase rate of maturation of immature stages; it may also increase mortality of larva as soil dries up faster
  - Effect of humidity: usually promotes survival by preventing desiccation

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Vector-borne diseases of livestock in sub-Saharan Africa

- What is the importance of VBDs in livestock in Sub-Saharan Africa?
  - Vectors and vector-borne diseases are responsible for major productivity losses in livestock
  - Some also affect humans

- What are the most important VBDs diseases of livestock in sub-Saharan Africa?
  - Rift Valley fever – mosquito-borne disease
  - Tick-borne diseases - East Coast fever
  - Trypanosomiasis – transmitted by tsetse fly

- What are the challenges in control and research?
  - Effect of climate change is often complex and difficult to predict
  - Majority of climate-sensitive diseases affect multiple species
  - Multi-disciplinary approach required with engagement of different stakeholders

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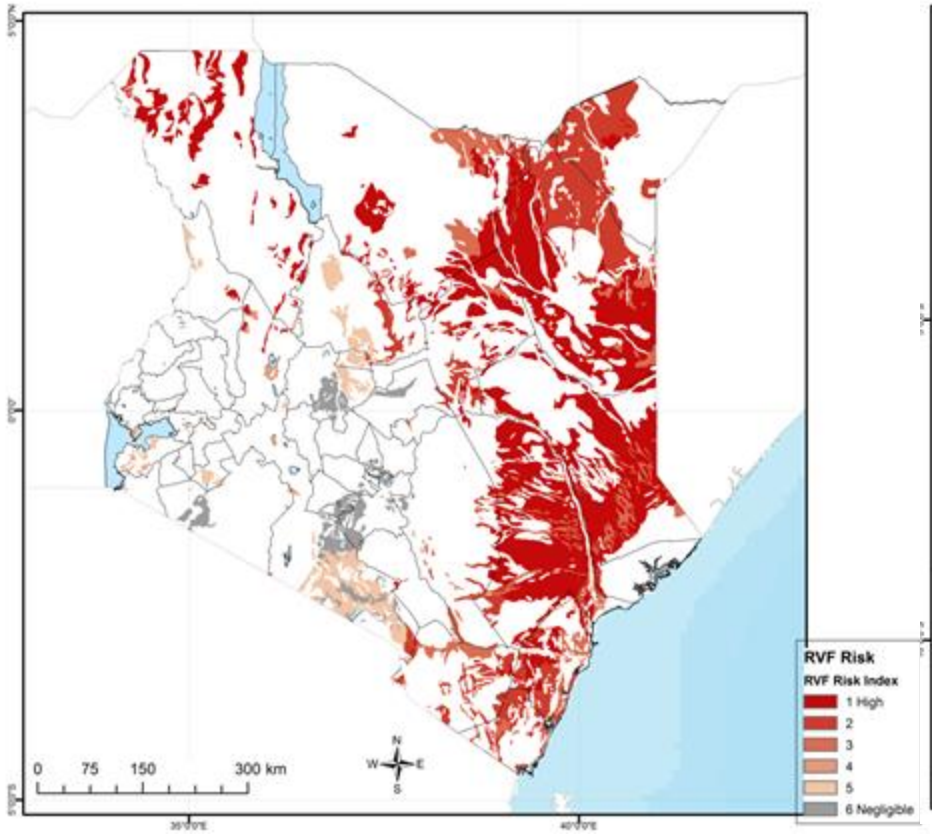
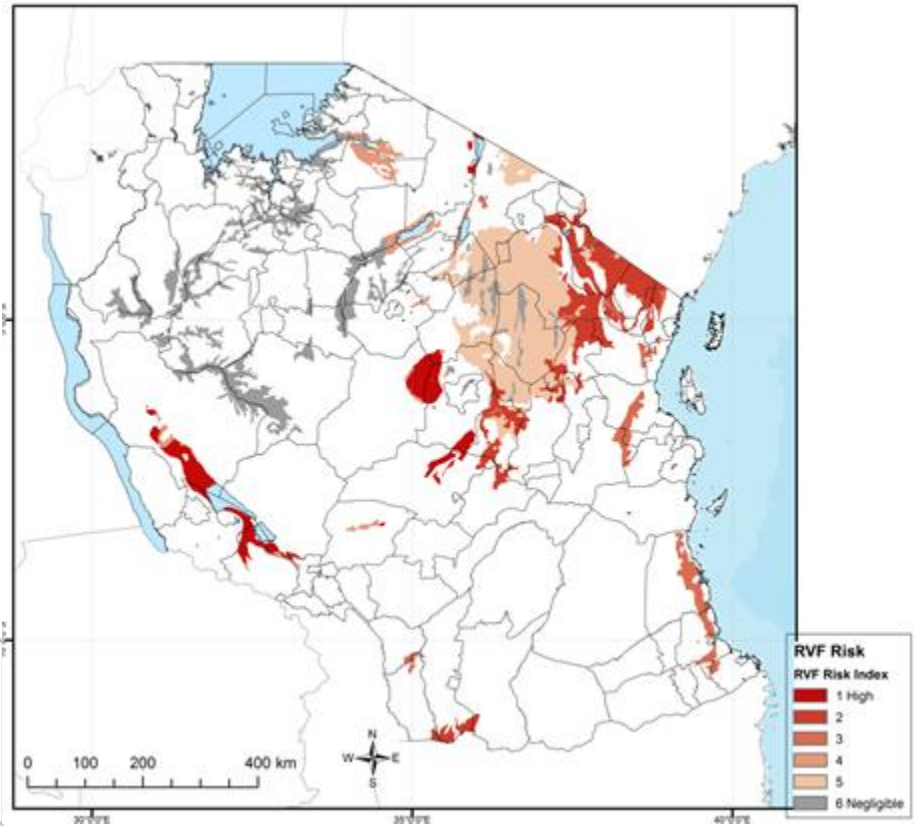
Risk mapping as a useful tool for forecasting



Kenya



Tanzania

Potential RVF hotspots in eastern Africa (predictions at 1x1 km)

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Thank you!

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